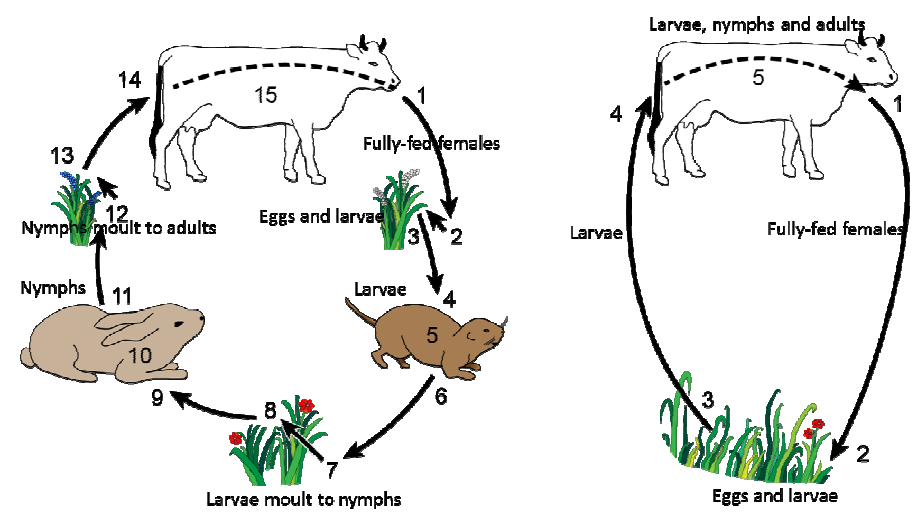




**SUB REGIONAL WORKSHOP ON
LUMPY SKIN DISEASE AND OTHER
VECTOR BORNE DISEASES**

FINAL REPORT



**28th February 2013
Larnaca, Cyprus**





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Final Report

1- Participants, date and venue of the workshop:

The meeting took place on the 28th February 2013 in Sunhall Hotel, Larnaca, Cyprus. Participants from 6 member countries attended the meeting: Cyprus, Egypt, Israel, Jordan, Lebanon, and Palestinian Autonomous Territories (PAT). (Annex 1: list of participants) as well as Dr Eeva Tuppurainen from Pirbright (UK), Dr Giovanni Savini from IZS of Teramo (Italy), Dr Joseph Domenech (OIE Head Quarters) and Dr Ghazi Yehia (OIE Regional Representation for the Middle East).

2- Objectives of the workshop:

After a welcome address by Dr Savvas Savvas representing Dr G. Kyrikides, CVO of Cyprus, Dr J. Domenech from OIE Head Quarters, defined the objectives of the meeting as follows:

- Exchange of information on Lumpy Skin Diseases (LSD) and other Vector borne Diseases (VBD)
- Assessment of disease situation, epidemiology in participant countries
- Control measures used, vaccines and vaccination monitoring,
- Insect control.

The meeting will also discuss:

- National and Regional active surveillance of infectious diseases.
- Laboratory capabilities for LSD and VBD
- Promotion of reporting of notifiable diseases to the OIE
- Strengthening direct or indirect means of communication
- Needs and supports.

2- Presentations from the experts

- **Dr G. Yehia**, OIE regional representative for the Middle East, briefly presented the Lumpy Skin Disease situation in the region as reported to the OIE. He noted that the disease historically spread from south and east Africa to northern countries of the Middle East.

In sub-Saharan Africa, LSD is now enzootic in all the countries in which it has occurred and has proved impossible to eradicate.

LSD was reported in the last decade in Kuwait, Bahrain, Oman, Yemen, Palestinian territories, Lebanon and Israel.

Dr Yehia mentioned that the region is actually exposed to a new wave of LSD and joint efforts for prevention and surveillance between VS in the region, is strongly needed.

Dr Yehia gave a brief review on the situation of other vector borne disease prevailing in the region which have a considerable impact on the livelihood of pastoralists and on the trade in livestock and livestock products.

He highlighted on the character of these diseases to be difficult to prevent and control as they are so resilient to intervention and so deeply embedded in the ecologies and landscapes of the regions they infest.

Rift Valley Fever, Bovine Ephemeral Fever, West Nile Disease, Crimean Congo Hemorrhagic Fever, Bluetongue are among important diseases that threat in the region and contingency plans for surveillance and control should be implemented.

- **Dr Eeva Tuppurainen**, (Head of Capripoxvirus Reference Laboratory, (Pirbright Institute) addressed the participants describing the pathology of the disease:

Lumpy skin disease (LSD) is an economically devastating cattle disease caused by lumpy skin disease virus (LSDV) (*Capripoxvirus*, *Poxviridae*). Until 1990s the disease was limited to sub-Saharan Africa from where it has slowly spread to the north becoming endemic across Africa.

In July 2012 the disease re-occurred in Israel. Infected beef cattle were located in the northern part of the country in close proximity to Lebanese and Syrian borders. In early 2013 LSD cases were also reported by the veterinary authorities of Lebanon and Palestine (WB).

Considering the current disease situation, it is highly likely that LSD outbreaks will spread throughout the region and LSD will become endemic in the Middle East which will raise concerns that the disease may continue spreading to the north, entering the Mediterranean countries via Turkey.

The transmission of LSDV is mainly mechanical via variety of blood-feeding arthropod vectors. However, it may, to a lesser extent, occur via contaminated feed and water, artificial or natural mating.

Although LSD is considered to be very host specific, the presence of the virus has also been confirmed in the skin samples collected from some wild ruminants showing characteristic clinical capripox disease.

For different vaccines used presently, Dr Eeva noted that the safety and efficacy of a live attenuated LSDV vaccine (Lumpy Skin Disease Vaccine for Cattle®, Onderstepoort Biological Product, South Africa) is now being tested in the field settings in Israel. Two other live LSD vaccines are currently commercially available, namely Lumpyvax®, Intervet, Namibia and HerbivacLS® Deltamune/Ceva Santé Animale, South Africa. All live LSDV vaccines may cause a local reaction at the vaccination site and a temporary decrease in milk production. In addition, these vaccines do not confer absolute immunity to all animals.

All live attenuated vaccines against LSDV are very sensitive to direct sunlight and therefore the vaccine bottles should be kept out of direct sunlight in cool temperature. Proper needle hygiene should be practised during vaccination campaigns; the needle should be changed between individual animals. Opened bottles should be used within 6 hours or less.

A swift and accurate laboratory confirmation of the tentative field diagnosis is required before relatively expensive control and eradication measures will be

commenced. A real-time polymerase chain reaction (PCR) assay provides a fast and reliable diagnostic tool for the antigen detection. However, due to the relatively expensive and fragile real-time PCR equipment, a gel-based PCR assay should always be set up as a back-up method. Both assays are previously published and sufficiently validated for LSDV.

Dr Eeva added that serological surveys for LSDV are constrained by the lack of suitable diagnostic tools. Unfortunately, there are no sufficiently sensitive and validated ELISAs available for LSDV. This is due to the highly variable surface structures of the infectious forms (3) of the virus. Serum/Virus neutralization tests are reliable but labour- and time-consuming and therefore not suitable for large scale testing. Immunity against the disease is predominantly cell-mediated and therefore antibody levels in vaccinated animals or animals with mild clinical disease may not be detectable by any serological assays.

- **Dr Giovanni Savini** from the Istituto Zooprofilattico Sperimentale dell'Abruzzo e Molise "G. Caporale" in Teramo/Italy gave an overview on the most important emerging viral vector borne diseases. He explained the peculiarity of the host-vector relationship, how viruses multiply within the tissues of the arthropod to produce high titers in the salivary glands and how are then passed on to vertebrates (humans and animals) through the bites of the arthropods.

Dr Savini added that, to establish and maintain an arbovirus transmission cycle three factors are essential: the arbovirus, the arthropod, and the vertebrate. However several factors might influence the emergence and re-emergence of the vector-borne diseases. He noted that arboviruses have recently developed strategies of adaptation and evolution to spread into new areas and eventually become established. Several recent examples show how tropical arboviruses spread into countries with temperate climates.

Dr Savini described the recent incursions of several Bluetongue virus strains in Europe and the way they spread.

Dr Savini spoke also on the viruses belonging to the Simbu serogroup (Akabane, Aino, Shamonda, Oropouche, Iquitos...), their characteristics and properties. All known Orthobunyavirus uses vectors for transmission, mainly midges of the *Culicoides* (Simbu sero-group) genus and mosquitoes.

Schmallenberg virus is strictly related to Akabane and Shamonda viruses

They cause mild clinical signs but if pregnant animals are infected, the virus could cause abortion and malformations depending on the pregnant period they are infected.

He introduced the West Nile virus (WNV) as an example of arbovirus which uses wild birds to spread. It is able to cause clinical signs in humans, horses and birds depending on the infected species and WNV strains.

He also detailed about other vector borne diseases such as RVF and CCHF

highlighting their importance and how their diffusion is associated to temperature and vector competence which influence the surviving rate of the vectors and the extrinsic incubation period.

Reproduction rate of vectors might also be influenced by the amount of precipitations in the area which play an important role in determining the recrudescence of RVFV infections.

He concluded his talk stressing on the importance of the "one health one medicine" and multidisciplinary approach to better control the vector borne infections which represent a serious emerging public health threat.

3- Presentation by country's representatives:

Country' representatives were requested to present a report on LSD and other VBD describing mainly country situations, national surveillance and control plans including vaccinations and vector control, diagnostic capabilities.

- **Representative of Egypt**, Dr Issam Al Batawi, announced that no new information is available on the occurrence of the disease in Egypt during the last two years but he pointed out that measures of surveillance and prevention are not likely sufficient and should be enforced.

- **Representative of Cyprus**, Dr Savvas Savvas, declared that the situation of vector borne diseases in his country is under regular control with permanent surveillance program being undertaken. No case of LSD has been reported in the island.

- **Representative of Jordan**, Dr Nisreen Abu Khairan, mentioned that, the veterinary services are aware of the situation of LSD in the neighbouring countries. Permanent surveillance plans are implemented in order to contain any potential spread of the disease to Jordanian territories. To date no case has been confirmed in the country.

- **Representative of Palestinian Autonomous Territories**, Dr. Imad Mukarkar, , declared that outbreak of LSD have occurred in the country. He said that, while the veterinary authorities are doing their best to prevent future occurrence of the disease, more assistance and support is needed.

- **Representative of Lebanon**, Dr Bassel El Bazzal, described in his presentation, the two cases of LSD which occurred in the South Lebanon province, just near the border with neighbouring countries and which were reported to OIE in November 2012 and January 2013. The two cases were contained and vaccination program is implemented in the affected area and its surroundings. He also described the structure of the Veterinary Services in Lebanon and the regular surveillance programs for the control of diseases they implement. Dr Al Bazzal called for transparent notification and reporting in any country in the region, so to facilitate prevention and early response.

- **Representative of Israel**, Dr Nadav Galon presented the situation in his country with an upsurge of LSD outbreaks in 2012-2013 in the northern part of the country close to the borders with Lebanon and Syria. The disease occurred in dairy and beef cattle farms. The initial picture around July 2012 showed 50 beef herds being infected (4,000 cows) raised in mutual and poor pastures, overcrowding, with 10-60% morbidity and 1-10% mortality. Control measures included i) in beef herds, vaccination (Sheep Pox JOVAC vaccine), movements restrictions and insects control; ii) in dairy herds and feedlots, all the above and euthanasia of sick animals. Beginning of 2013, in beef pasture;

Dr Galon explained what are the research activities on LSD in Israel (Kimron Veterinary Institute – KVI) in the field of epidemiology, vaccination efficacy (comparative efficiency Neethling VS Pox-10) and vector control.

Dr Galon also summarized the Israel situation with regards to other vector borne diseases present in the country such as BTV (endemic situation with the presence of serotypes 4,5,6,8,10,15,16, 24), bovine ephemeral fever and EHDV. RVF is present in regions of Egypt very close to Israel.

4- Discussion forum:

In the afternoon, participants discussed the situation in its different aspects with particular reference to:

Disease prevention and control measures,
Choice of appropriate vaccines and vaccination monitoring,
Vector distribution and control,
Emergency planning for surveillance at both national and regional levels,
Dr Tuppurainem emphasized that the diagnostic capacity for LSDV, vital for the early detection and early warning system, should be built up in the central or regional reference laboratories in the Middle East countries. This requires strong commitment from the local governments and national veterinary authorities. The laboratories need to be provided with suitable facilities to handle OIE listed viruses, equipment, reagents and materials. The staff need to be trained to be competent to perform the diagnostic assays for the detection of LSDV, sufficient veterinary infrastructure is also required for sample collection and transport in case of a sudden incursion of the disease. Fully functional early warning system would allow the onset of vaccination campaigns within the region, well in time and not when the first clinical signs are observed and the herd is already incubating the disease.

Regional laboratory network set for LSDV would hopefully improve personal, unofficial and official communication on the disease within the region. The performance of the laboratories should be evaluated by ring trials on the diagnostic methods for LSDV. The annual ring trial meetings should be held to update the laboratory staff and discuss the most recent developments in the diagnostic field.

Dr Eeva concluded that successful eradication programme for LSDV relies on early detection of infected animals, swift implementation of large scale vaccination campaigns, cattle movement restrictions, vector control, stamping-out (if feasible in the country) and accurate reporting. The control of cattle movements may be a challenging task due to the transhumance mode of farming or illegal cattle movements from the infected zone. This will further emphasize the importance of the vaccination campaigns using safe, effective and affordable vaccine. There is no doubt that also in endemic areas the disease can be controlled /eradicated if sufficient herd immunity (80% susceptible animals should be immunized) can be achieved and most importantly, maintained using readily available effective vaccines.

Regarding the One Health Concept, Dr Savini mentioned that that it is a worldwide strategy for expanding interdisciplinary collaborations and communications in all aspects of health care for humans, animals and the environment in the 21st century. The resulting or expected synergies will advance health care beyond by accelerating biomedical research discoveries, enhancing public health efficacy, expeditiously expanding the scientific knowledge base, and improving medical education and clinical care. It will also, when properly implemented, help protecting and saving untold millions of lives in our present and future generations.

5- Conclusions:

Participants agreed that actions should be taken to contain potential spread and prevent occurrence in other areas/countries. These actions should consider the followings:

- 1- That the Middle East, especially the East Mediterranean region, is facing a new wave of the spread of the LSD virus beyond its current geographical area where previous outbreaks have been reported and that new vector-borne diseases, such as bluetongue, are now occurring for the first time in Mediterranean Basin,
- 2- The increasing volume of international and inter-regional trade within the Middle East,
- 3- That global trends, combined with changes in animal husbandry, urbanisation, modern transportation and globalisation, have resulted in a global emergence or re-emergence of epidemic vector-borne diseases affecting both humans and animals over the past 30 years
- 4- The overall vector capacity of vector species which is influenced by other biological and behavioural characteristics of the arthropod population,
- 5- That the control of vector-borne diseases in the region has been impeded by the lack/absence of entomological research to deal effectively with the pivotal transmitting factor,
- 6- The relatively long incubation period of LSD and other vector-borne diseases that may delay the symptoms of the diseases during shipping period of exported animals,
- 7- That proper vaccine against LSD is not yet well performed and that the vaccination process with the Pox Vaccine needs to be clarified.
- 8- The socioeconomic impact of the disease on animal production and small-scale farmers,
- 9- The critical role of inter-regional collaboration for the success of the control strategies. Other regions are invited to join the Middle East efforts to control vector-borne diseases.

According to the above highlighted considerations, participants agreed that measures to be taken, nationally and regionally should target the followings:

- For countries in the region:

1. Middle East countries will enhance information sharing by chief veterinary officers (or deputies) or other government authority particularly on LSD and vector-borne diseases,
2. A regional network of national epidemiologic teams on LSD and other vector-borne diseases as well as vectors to be developed including the international OIE collaborating centres and the results of these activities be shared to support early warning efforts of regional Members,
3. Countries under the threat of spread of LSD and other vector-borne diseases in the Middle East join the regional emergency control plans though they are not currently affected (or though these diseases have not been officially reported within their territories),

4. A value-chain approach that includes livestock keepers, animal health authorities and other stakeholders be adopted to engage all key players in the control efforts of animal diseases,
5. Middle East countries establish a cross-border disease monitoring system that considers the complexity of the risk factors for the introduction/persistence of LSD and vector-borne diseases,
6. Laboratory network be established to support disease surveillance and early warning activities regarding the introduction and circulation of LSD and vector-borne viruses,
7. Vaccine production and vaccination activities against LSD and vector-borne diseases comply with OIE standards and on quality control procedures,
 Research on vaccines efficacy and efficiency be promoted with the support of OIE reference and collaborating centers. It would benefit everybody to disseminate the research data on the vaccine efficacy as soon as possible.
8. The implementation of the above activities be supported by the establishment of a Middle Eastern Working Group to manage issues relevant to vector-borne diseases and to develop advocacy for improve political commitment and investment in the prevention and control of these diseases,
9. Proposals for a regional control and research activities be drafted and presented to the forthcoming conference of the OIE Regional Commission for the Middle East to be held in September 2013,
10. Countries ensure compliance with their obligations on transparent animal disease information by promptly reporting all outbreaks of LSD and other vector-borne diseases to the OIE. Exporting and importing countries follow the standards, guidelines and recommendations of the OIE regarding international trade of ruminants and products with respect to LSD and other vector-borne diseases with particular attention to the application of diagnostic tests, quarantine and use of vaccines.

- For OIE and other international organizations:

Participants addressed OIE and other International Organisations for support and assistance especially in the followings:

11. The OIE continues to develop surveillance guidelines for vector-borne diseases taking into consideration the effect of climatic changes on the global spread of these infections
12. Training and technical assistance be provided to countries by OIE and their reference laboratories and other appropriate organizations and development partners to support countries within the risk areas in the Middle East for rapid diagnostic of the diseases and to undertake predictive epidemiological studies for contingency planning,
13. The OIE continues its efforts within the Middle East countries to promote and develop good veterinary governance to enable countries to effectively prevent and control LSD and vector-borne diseases,
- 15-Entomological surveys and ecological studies and research be developed at the regional level to support regional and inter-regional efforts and plans with focus on monitoring the disease cycle and minimizing the impact of vectors on the patterns of disease spread.

In conclusion, the commitment of the local governments is fundamental for the successful control of LSDV. A contingency plan should be in place and risk factors for LSD should be identified. Appropriate conditions should be set for the importation of live domestic and wild ruminants from countries considered infected with LSDV.

Every effort should be made to enhance the diagnostic capacity in the local and regional laboratories. Accurate and swift reporting on a disease outbreak should be considered as a priority.

Further efforts are still required to enhance constructive and transparent communication within the region. Interdisciplinary collaborations and communications in all aspects of health Contingency plans be strengthen for humans, animals and the environment.

The complexity of the interrelationship between animal movements, hosts densities and vector distribution needs a multidisciplinary approach and international surveillance networks to properly face the new challenges.

The participants agreed that the above recommendations be presented for the OIE regional commission meeting in May for approval.

6- Acknowledgements:

The participants want to express their sincere thanks to the Cyprus authorities and to the OIE for the organization of this meeting.

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and other Vector Borne Diseases
Larnaca, Cyprus**

28th February 2013

Time	Theme	Speaker
09:00 – 09:30	Welcome addresses Objectives of the meeting	Dr Ghazi Yehia (RRME) Dr Gorgios Kyriakides (Cyprus)
09:30 – 10:00	LSD worldwide situation, surveillance measures including vaccination and insects control	Eeva Tuppurainen(Pirbright DVE Ref. Lab., UK)
10:00 – 10:30	Other vector borne diseases: General disease situation, emergence factors, control measures	Giovanni Savini (IZS Teramo, Italy)
10:30 – 11:00	Morning Break Tea/Coffee	
11:00 – 13:00	Country reports on LSD and other vector borne diseases: Country situation, national surveillance and control plans including vaccinations and vector control, diagnostic capabilities	Countries Representatives (20 min. Each)
13:00 – 14:00	Lunch Break	
14:00 – 15:30	<u>Forum of discussions:</u> - Disease prevention and control measures: Vaccines and vaccination monitoring, Vector distribution and vector control, Emergency plans, Surveillance: national, regional.	All participants; facilitators: experts, J. Domenech and G. Yehia
15:30 – 16:00	Afternoon Break Tea/Coffee	
16:00 – 17:00	<u>Forum of discussions (Cont.):</u> - Laboratory support - How to improve regional communication and reporting.	All participants; facilitators: experts, J. Domenech and G. Yehia
17:00- 18:00	Conclusions, recommendations and closing	Joseph Domenech